

PROCEEDINGS
OF THE
SCIENTIFIC MEETINGS
OF THE
ZOOLOGICAL SOCIETY OF LONDON

January 6, 1880.

Prof. Flower, LL.D., F.R.S., President, in the Chair.

Prof. Newton, M.A., F.R.S., V.-P., drew the attention of the meeting to a specimen of *Chætura caudacuta* (the "Needle-tailed Swallow" of Latham, Synops. Suppl. ii. p. 259), which had been intrusted to him for exhibition by Mr. G. B. Corbin, of Ringwood, near which place it had been shot on the 26th or 27th of July last. About the middle of that month Mr. Corbin saw one evening two strange birds flying over the river Avon in company with Swifts, and in the course of the following week had better opportunities of observing at least one of them. A few days after Mr. Corbin held in his hand the bird now exhibited, which had been shot in the meantime, and was, he had no doubt, one of those he had previously watched. Prof. Newton stated that this example was the second of the species known to have been obtained in this country—the first having been shot in July 1846, near Colchester (Zool. p. 1492), and examined, before it was skinned, by the late Mr. Yarrell and other naturalists of authority. The species was described by Latham from a specimen procured in New South Wales; and for a long time Australia was thought to be its *habitat*. By degrees ornithologists learned that it was only a regular visitant to that country from its real home in Eastern Siberia, where it was first discovered by Steller, while Pallas, not knowing it was identical with Latham's *Hirundo caudacuta*, redescribed it (Zoogr. R.-As. i. p. 541) under the name of *H. ciris*. It has since been recorded from Nepaul, Sikkim, and

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Bhotan, and is said to breed in the Himalayas; but the examples which have reached England have most likely made their way hither from Siberia. It is no Swallow, but a Swift, belonging to the genus of *Cypselidæ*, to which, in 1826, the name *Acanthylis* (properly *Acanthyllis*) was applied by Boie, and *Chætura* by Stephens—a genus which differs from *Cypselus* in the structure of its foot and in the spine-like tips of its rectrices.

Dr. Mulvany, R.N., exhibited a specimen of a Penguin of the genus *Eudyptes*, and read some remarks on it which tended, in his opinion, to show that a moulting of the horny sheath of the beak took place in this species.

The following papers were read :—

1. Preliminary Notes on Individual Variation in *Equus asinus*.

By JOHN HENRY STEEL, M.R.C.V.S., F.Z.S., Demonstrator of Anatomy at the Royal Veterinary College.

[Received December 8, 1879.]

The remarkable uniformity in external characteristics which ages of neglect and degradation have conferred upon the Ass of this country contrasts so forcibly with the amount of variation presented by certain of our domesticated animals that some have based upon it conclusions of a general nature tending to the admission of essential differences between the effects of natural selection and those resulting from artificial influences. For proof that these views are untenable we need simply refer to the fact that on the Continent, in the East, and even through quite recent artificial selection in America external variation in the Ass is very marked. With regard to modification of internal structures, we believe the following are worthy of note as the outcome of the large number of dissections made by ourselves and by students under our supervision. We were hardly prepared to observe so much variation, and were struck by many Ruminant affinities of *Equus asinus*. Our observations are not arranged in a statistical form; nor have we occupied our time with minute variations in bulk, length, and capacity; we have selected those characters which are most striking and at the same time most instructive.

OSTEOLOGY.

Vertebrae, Cervical.—*Atlas* and *Dentata*: imperfect condition of foramina for spinal nerves, due to arrested development.

Seventh vertebra, Prominens: vertebral foramen may occur in one or both transverse processes.

Transverse process with costiform prolongation. This condition is remarkable as showing a tendency to increase in the number of the ribs. The process is invariably autogenous, and not unfrequently sends a styloid prolongation downwards in the adult; but this is

generally short, although we have seen it long and connected with the first rib below the upper head of scalenus by an elastic band; and in a specimen now before us the transverse processes are asymmetrical, several inches in length, prolonged by well-marked elastic bands to cartilaginous nodules appended to the prosternum in front of the first sterno-costal articulations.

Dorsal and Lumbar.—The dorsal intervertebral gaps are sometimes truly intervertebral; often each is wholly pierced through the pedicle of one vertebra. The degree of separation of the costo-transverse articulation from that for the head of the rib varies much in the posterior dorsal vertebræ of different individuals. The last ribs also vary much in length, size, and degree of curvature. The presence of a so-called “floating rib,” making the series nineteen in number, is frequently observable. This “*floating rib*” is generally present only on one side. It is not a vertebral rib, but a sternal rib; for it is appended to the extremity of one or two lumbar transverse processes, the homotypes of the vertebral costæ of the dorsal region. Often, when not represented by bone, it occurs as a portion of cartilage or a band of white fibrous tissue, embedded in the abdominal muscles in such a manner as to remind us of the homotypical concordance of the intercostals and the abdominal muscles.

In the *sacral region* it is often difficult to define the extent of the “false sacrum” backwards; for coccygeal vertebræ become appended by ankylosis, increasing apparently the ordinary number of five sacral bones. The last lumbar, too, sometimes assists in the support of os innominatum; and in other respects the “true sacral bones” are not always the same.

Coccygeal.—Vary in number, especially with age.

The peculiar modifications which we have noted in the seventh cervical, the uncertainty observable in the anterior and posterior parts of the lumbar and sacral regions, and the variation in the number of ribs prominently bring to our mind the question “How is the vertebral column becoming modified in the present day?” and also, “Will an examination of these points throw any light on the remarkable preponderance of dorso-lumbar vertebræ and costæ in *Perissodactyla ungulata*?”

Skull.—Exhibits many minor variations, most of them probably sexual or due to age.

Limbs, Fore.—*Scapula*: differences in figure, thickness etc. Often, instead of the gradual disappearance of the spine inferiorly, it terminates in a slightly prolonged process, a rudimentary acromion similar to that seen in the Ox, but smaller. Medullary foramen varies in position; also glenoid cavity rounded or oval.

Humerus: synovial fosses vary in size and form, as do those in upper part of *radius* and *ulna*. The *ulna* generally extends downwards only two-thirds of the length of the radius; but in the foetus it is much longer in proportion, and in the adult we occasionally find it passing downwards to the supero-external part of the knee to articulate with os cuneiforme. If we examine the inferior extremity of the radius of the foetal colt, we may note that at its external part is

a small ossific centre. Our cases of variation show us that we must describe this as *the inferior extremity of the ulna*. The value of this observation as illustrating the similarity of the forearm of the Ass to that of the Ox is evident.

Carpus: os trapezium v. pisiforme generally present, but sometimes absent.

Metacarpus and *Phalanges*: major variations do not come under our notice (in the Ass).

Hind.—Os innominatum: form, size, and relations of auricular facet of ilium vary.

Fibula varies similarly to ulna in fore limb. Often extends to tarsus, occupying whole length of outer part of tibia. In other cases, and generally, consists superiorly of a small button-shaped appendage externally placed to upper part of tibia, tapering to a point inferiorly, from which a white fibrous band extends downwards, becoming continuous with the inferior extremity of the tibia, the external part of which is developed from a distinct ossific centre, the representative of the tarsal fibula of Ruminants.

Tibia and *astragalus*: synovial fossettes vary in development.

Smaller tarsal bones very frequently united by ankylosis into a single mass, without any external indication of disease. This is the condition known to veterinary surgeons as "occult spavin." We are not yet prepared to attribute to it any morphological importance.

Cuneiforme parvum composed of one or of two portions.

SPLANCHNOSKELETON.

Ossification or calcification of the posterior portion of the sclerotic occurs in old Asses.

Os hyoides presents between cerato- and stylo-hyal on each side a bony nodule representing the epihyals, which are well developed in the Ox.

An *os cordis* has been observed in the Ass; it is always present in the Ox.

MYOLOGY.

Head.—We generally observe muscular fibres which run from the antero-external angle of orbicularis palpebrans beneath zygomaticus to the outer surface of buccinator. These represent *lachrymolabialis* of the Ox, and are seldom seen in the Horse. They are deficient in some Asses.

Retractor labii superioris sometimes has a supplementary portion which runs from the common point of origin of the muscle to the tendon of the nasalis longus labii superioris, which it draws downwards, and also to spread out by some of its fibres over the superior part of the "false nostril."

The "false nostril," the peculiar nasal pouch of Equidæ, undergoes considerable variation at its extremity, sometimes presenting a slight tendency to bifidity of its cul-de-sac. In the Ass it is seldom used; for the animals are never driven to such extremes of rapid progression as the horse. Hence we often find these sacs distended with

masses of laminæ of epithelial débris. The *dilatatores naris* vary in their arrangement in relation to this pouch; thus, ordinarily a continuous series of fibres extends to it from above, behind, and below, being the superior and inferior dilators. But we have seen excessive development of the band against the cul-de-sac of the pouch and deficiency of the other parts of the series. The posterior extremity of *retractor labii superioris* has sometimes a muscular addendum connecting it with the zygomatic ridge.

Mylohyoideus varies somewhat in being divided generally at its anterior part into two distinct planes.

Geniohyoideus sometimes sends a small distinct band to genioglossus at about the centre of the intermaxillary space.

Hyopharyngeus, in addition to its usual attachment to the inferior part of internal surface of superior third of stylohyal, has often another one, quite distinct from the inferior third. We more frequently see the latter in the Horse.

Hyoideus parvus sometimes absent.

Hyoglossus brevis sometimes attached to stylohyoid, generally not.

Arytænopharyngeus is occasionally well marked.

Retractor oculi may form a complete investment of the optic nerve, or consist of four bands corresponding with the recti.

The *middle oblique muscle* of the eye, as described by Strangeways, occasionally occurs in the Ass.

The inferior opening of the lachrymal ductus ad nasum varies in position; generally it opens at the upper part of the anterior naris, thus differing remarkably from the same structure in the Horse.

Neck.—*Levator humeri* never shows the fibrous band indicative of the seat of the clavicle, which this muscle has in the Ox, Pig, and other Ungulates; but this information is conveyed in some subjects, in which we have seen a small muscle running from levator humeri around the anterior part of pectoralis anticus to the inner side of that muscle, where it disappears.

Serratus magnus has sometimes a distinct rudimentary division passing to second cervical transverse process, generally only extends as far forwards as the third (see arrangement in Ox).

Scalenus: instead of terminating by each head at the first rib as in the Horse, the superior division may be prolonged to the third rib or even further back (see arrangement in Ox) over serratus magnus.

Longus colli we have seen attached only beneath the five anterior instead of the six anterior dorsal vertebræ.

Back.—*Transversalis costarum* posteriorly in some cases is large and muscular and blended with longissimus dorsi in the lumbar region; in others it is tendinous and inserted into first lumbar transverse process.

Serratus posticus minor varies considerably in its development and attachments.

Latissimus dorsi just before its insertion into the humerus varies in its relations with scapulo-ulnaris. Sometimes serial muscular

bands beneath the arches of the ribs run from one rib to another, crossing two or three; these *subcostales* vary in number, are sometimes continuous posteriorly with the *psoæ*, and are covered by the *pleuro-costalis*,

Transversalis abdominis varies in the degree of extension of its tendon towards the internal abdominal ring. The *rectus abdominis* has a variable number of transverse tendinous markings.

LIMBS.

Hind.—*Sartorius* superiorly is attached to the tendon of *psoas parvus*, to the *os innominatum* with *psoas parvus*, or only to the lumbar fascia, sometimes to two or even three of these points.

Flexor pedis perforans sometimes presents a distinct muscular belly and tendon, probably a representative of the *flexor longus hallucis* found in man.

Variations of pedal muscles less marked than in fore limb.

Fore.—*Scapulo-humeralis posticus* sometimes almost obsolete.

Teres externus sometimes divisible into *teres proper* and *acromio-humeralis*, as in *Ox*.

Flexor brachii.—Superior tendon has a remarkable piece of red muscular structure on its anterior part, which varies considerably in size. Also the band which runs from this muscle to *extensor metacarpi magnus* may often be separated nearly to the knee; careful dissection shows that the inferior extremity of this muscle is somewhat divided into two parts similar to those seen in *Dog* &c.

Pronator teres is of frequent occurrence inside the elbow-joint, arising from the internal inferior prominence of *humerus*, inserted just below internal lateral ligament, crosses radial artery, vein, and nerve. Generally this muscle is represented only by a small white fibrous band.

Extensor pedis.—*Thiernesse's* and *Phillip's* muscles sometimes distinct, often imperceptible.

Lumbrici vary in number and size. The *interossei* of the large metacarpal, which in the *Equidæ* form the superior sesamoideal ligament, vary in their amount of muscular structure and in their bulk.

NEUROLOGY.

Nerves remarkably uniform; sometimes the transverse metacarpal branch is not immediately subcutaneous, but separated from the skin by a longitudinal band of fibrous tissue.

SPLANCHNOLOGY.

Sometimes a third rudimentary circumvallate papilla a little behind the two usually present. Position of parotid opening varies to a slight degree.

Teeth.—*Incisors*: sometimes only four present in each series, corner permanent incisors having never appeared. Occasionally the upper incisor series has quite become lost—either a result of wear or fracture. The superficial resemblances of this condition to that which occurs in the *Ox* is, of course, of no morphological value.

Canines long or short, sexual variation.

Premolars: small "Wolves' teeth" occasionally present in front of four anterior molars.

Stomach often presents a very marked central transverse constriction where cuticular mucous joins the villous.

Cæcum sometimes retains the form it presents in eight months' foetus; its apex sometimes very elongated and pointed.

Colon.—Longitudinal muscular bands vary in size and in number at different parts of the bowel.

Liver.—Lobes vary in form and much in size. Ligaments differ in degree of development, especially falciform ligament, which sometimes runs as far backwards as umbilicus, containing a pervious vein in its thin free margin.

Parovarium.—On outer surface of broad uterine ligament, sometimes large, often obsolete.

Male mammae often extremely large.

Thyroid body varies much in form, especially in the size of the band connecting its lateral masses. *Conchial cartilages* prolonged downwards by small rounded band to lateral part of guttural pouch and to posterior angle of stylohyal. A remarkable peritoneal band sometimes runs from the cæcum to the omentum major, reminding us of a condition we have noted in one form of *Macacus*.

ANGIOLOGY.

Anterior aorta often entirely absent. Sometimes a large anterior mediastinal branch passes downwards from this vessel. The dorsal and posterior cervical vary in their relations to each other. Generally these vessels are united on the right side and distinct on the left; but this condition may be reversed. The cervical may become united by a well developed subcostal with the sixth costal as given off from the posterior aorta; but this is not constant. The vertebral passes through or below the seventh cervical transverse process. The submaxillary may arise directly from the carotid instead of from the external carotid. External pectoral arises from internal pectoral, or axillary.

Posterior aorta.—Bronchial and œsophageal often arise by common root, or are distinct. Renal may supply suprarenal capsules and kidney; or the former may be supplied directly by a branch from the posterior aorta. Spermaties—one sometimes considerably more anteriorly placed than the other, even given off by posterior mesenteric. Between internal iliacs occasionally a small middle sacral arises. The obturator, epigastric, and inguinal sometimes arise from external iliac. The origins of the profunda and of the artery of the cord often vary.

The medullary artery of the femur is sometimes given off through the foramen at the anterior part of the bone instead of at the internal surface of the bone. The artery of the humerus is similarly variable. The circumflex of the toe is variously formed in different cases.

Thus from these examples we see the arteries are the most fre-

quent subjects of variation. The veins also are not regular. These differences are as numerous and as marked as those in man.

Our observations point to important affinities, and, we have reason to believe, may direct attention to conclusions by no means as yet generally received. So we are in hopes that we have not overestimated the importance of our subject. Investigation of varietal modification of domesticated animals should teach us the general laws and methods of modification, and thus bear fruit in advancement of the science of anthropology, in promoting the scientific management of our animal servants, and in rendering our knowledge more exact with regard to those forms which inhabited the earth in bygone ages.

2. Notes on *Chlamydophorus truncatus*.

By E. W. WHITE, F.Z.S. Lond., and F.Z.S. Reip. Arg.

[Received Dec. 9, 1879.]

During my recent travels through the western provinces of the Argentine Republic, this beautiful little plantigrade aberrant member of the Armadillo family enticed me, in the month of August 1879, to undertake a ride of forty leagues from Mendoza and a diligent search for six days in company with a large number of men, in order to obtain a better knowledge of its habits.

The range of *Chlamydophorus truncatus* extends in latitude from the valley of Sonda, province of San Juan, 31° S. lat., down to San Rafael, seventy leagues S. of Mendoza, 34° S. lat., and in longitude from San Luis to the Andes. In the same neighbourhood are found three species of true Dasypodidæ.

I was fortunate enough to secure one living specimen of the *Chlamydophorus*, which, in spite of the utmost attention, survived capture only three days; in fact, no instance has occurred of a longer survival than eight days in captivity.

The usual drawings of this animal in zoological works are erroneous in more than one particular; for instance:—

(α) The tail is represented as flexible and terminating in a somewhat flattened though, on the whole, solid pointed paddle—whereas it is almost perfectly inflexible, the paddle at the extremity being completely flattened and rounded at the vertex.

(β) The fringe attached to the inferior edge of the scute is depicted as continuous, and drooping from the outer margin of one eye completely round to the outer margin of the other: the fact is, whilst the silky fringe from the lateral surface of the scute is drooping and inclined towards the tail, that issuing from the ultimate enlarged ring of the dorsal carapace, uniting with that from the exterior ring of the truncated extremity, forms a double somewhat bristly fringe standing out pretty well at right angles to that truncated extremity.

(γ) The lateral edges of the dorsal chitinous shield are represented as though forming a continuous wave-line, whereas these lateral edges are sharply serrated.

(δ) In some drawings the body is figured as almost nude, or at most covered only with scanty short hair; the truth is, the body is covered throughout, even down to the extremities of the humerus and femur, and beneath the dermo-skeleton to the dorsal ridge, with a thick silky downy mantle.

(ϵ) In all drawings that have come under my observation the eye is delineated as distinctly visible—whereas, in nature it is rudimentary, besides being completely covered by the intermingling of the fringe and mantle.

(ζ) In all published representations there is a general deficiency of apparent solidity and roundness towards the truncated portion; the body is too much flattened. The fact is, the basal rings of the dorsal coat-of-mail increase in circumference until they coincide with the outer edge of the truncated extremity, the sections gradually rising from an elliptic to a circular form; further, the projection of this slightly convex truncated extremity is very exactly a sector of a circle, the centre of which is in the point whence issues the tail, the whole of this truncated armour-plate forming a very hard, solid, bone-like structure, which at once suggests the use to which, in my opinion, it is devoted, viz. to act as a rammer to consolidate the sand and fill up the entrance to its burrow from the inside and thus prevent the ingress of its enemies.

(η) The nature of the ground frequented is generally represented as rocky; now a *Chlamydophorus* on a rocky eminence is an anomaly, as it is only found on and in médanos (sand-dunes), or in their proximity, the characteristic vegetation of which is low thorny brushwood and cacti.

When walking, the *Chlamydophorus* plants both the fore and hind feet on the soles, and not on the contracted claws, as is the case with the Ant-eater, carrying its inflexible tail, which it has no power to raise, trailing along the ground and much inclined downwards from the body. As it commences to excavate, the fore feet are first employed; and immediately afterwards, supporting its body on the tripod formed of these and of the extremity of the tail, both hind feet are set to work simultaneously, discharging the sand with incredible swiftness.

The burrows, which are never left open, usually have but slight, if any, inclination to the horizon.

Although analogy and form would seem to indicate it, I never could detect the tail aiding in the operation of excavation; in fact, its inflexibility precludes this idea: the only use of the flattened extremity appears to me to be, to furnish it with a more secure point of support in the shifting sand.

Sluggish in all its movements except as a fodient, in which capacity it perhaps excels all other burrowing animals, the *Chlamydophorus* performs the operation of excavation with such celerity that a man

has scarcely time to dismount from his horse before the creature has buried itself to the depth of its own body. With regard to its movements within the burrow, these, as well as the structure of the tunnel, seem to me to be governed by the general timidity of its character. The tunnel is scooped out of the exact size of the truncated extremity, so that whenever the animal feels inclined to quit its subterranean dwelling, this must be accomplished in one of three ways—either (α) by a retrograde motion, using the ram to burst through a consolidated wall of sand, or (β) by turning its body round and emerging from the entry head first, or (γ) by tunnelling in advance and emerging from a different hole. The third, in my opinion, is the course followed by the *Chlamydophorus*; for, although when put into a box, under suitable conditions, I observed that by first inclining itself on one side, bringing the snout into close proximity to the body and directed towards the tail, with a screw-like motion the animal was able to wriggle itself round and effect a complete turn, notwithstanding that at first sight the rigid tail would appear to be fatal to such a movement; yet such a procedure is unnatural, and must be productive of inconvenience, and would, of course, be altogether impossible were it not that the dorsal scute, which is only attached longitudinally along the dorsal ridge, is extremely flexible—so much so, indeed, that it can be easily bent slightly upwards on the merest pressure from the fingers; a further illustration of this great flexibility is furnished by the fact that when laid on its back, the animal quickly recovers itself.

The only sound I heard it utter was that of distinctly sniffing like a dog; and this it always does when in search of a spot for excavating.

So extremely sensitive is this delicate little burrower to cold that my living example, after passing a night in a box of earth covered with flannels, was found the following morning in a very exhausted condition. Wrapped in warm clothing and placed near a fire it soon revived. On taking it into my hand under a Mendozan midday sun it shivered violently; but whether through fear or chill it is impossible to say. Its normal paradise seems to be when the temperature of its residence is such as is produced by sand so hot as almost to scorch the hand; and yet, if cold be unfriendly, no less so is wet; for although its winter is spent beneath the earth, a fall of rain quickly drives it from its retreat. During summer it leaves its burrow at dusk to search for food; and being truly nocturnal, moonlight nights are very favourable for discovering it.

I placed my solitary specimen on the ground, first on brick and then on wooden flooring; but knowing that it could not excavate, it merely walked round in circles—a further evidence that it cannot see, or only very imperfectly at any rate, by daylight; but far different was its behaviour on being transported to the soil, where after a preliminary snuffle or two, indicating keen scent, it set to work immediately to delve at a very rapid pace.

In the specimen I studied, the translucent dermo-skeleton and all the exposed parts were, during life, of a delicate pink tint, the hair

a glistening snow-white and of silky consistency. The use of the fringe surrounding the shield is, in my opinion, solely to prevent the introduction of sand beneath it during excavation.

The light fine sand in which the *Chlamydophorus truncatus* burrows proclaims unmistakably its presence, as well as that of even the minutest animals, by the tracks left; the fox, the beetle and the spider are thus equally betrayed. The natives are apt observers of these, and even from the saddle will decipher and distinguish at a glance the various foot-prints, and unerringly detail the animals that have passed any assigned spot during the night. With regard to our elegant little friend there is no mistake; besides the impressions of the four feet, the inclined stiff tail leaves its deep central indented line. Of course, after rain, which falls but seldom, the track is accentuated; and the only sure way of effecting a capture is to follow it, as it leads directly to a small hillock of sand, by removing which, the entrance to the tunnel is exposed to view; and if the tracks were numerous, the animal would no longer be rare; but it is a fact that a year or more sometimes elapses without any trace of its existence. In a few instances specimens have been unhoused by the plough.

I could not succeed in discovering the nature of the food from the solitary live specimens I obtained; but I fed it on milk, which it lapped like a cat. I then endeavoured unsuccessfully to entice it with chopped meat, and only by artifice introduced some pieces into its mouth, which it swallowed.

There are authentic cases of the *Chlamydophorus* being preyed upon by other animals, especially by Foxes and Cats.

3. Description of a new Species of *Mus* from the Fiji Islands.

By OLDFIELD THOMAS, F.Z.S. Assistant in the Zoological Department, British Museum.

The subject of this description was obtained in October 1878, near the village of Waitovu in the island of Ovalau, by Baron A. von Hügel, who resided for some years in the Fiji Islands, and who has presented his small collection of Fijian Mammalia to the British Museum. This collection consists of specimens of *Pteropus samoensis*, Peale, *Notopteris macdonaldi*, Gray, *Emballonura semicaudata*, Peale, *Mus decumanus*, Pall., *Mus exulans*, Peale, and the specimen here described.

The most noticeable point about this species is the character of the fur, which is extremely long, soft, and silky. The only other Rodent at all resembling it in this respect is the *Hesperomys panamensis* of Gray¹, which has a similar character of the fur, though in a lesser degree.

¹ *Neomys panamensis*, Gray, Ann. Mag. Nat. Hist. 1873, xii. p. 417.

The muzzle is distinctly grooved from between the nostrils to the upper lip. The ear is rounded, nearly as broad as long, and is covered on both sides with short silvery hairs, which form a very narrow fringe round the edge. The dorsal surfaces of the feet are also covered with similar, but longer, hairs.

The length of the tail is rather less than that of the head and body combined; and it is sparsely covered with short brown hairs, not hiding the scales.

The palm-pads of the hind feet are six in number, arranged as shown as in the accompanying drawing. The fore feet are too much dried up in the type specimen for the shape of their pads to be distinguishable.

The colour of the fur all over the body is of a light slate-colour for seven eighths of its length. The terminal eighth is brown along the centre of the back, becoming lighter towards the sides. On the



Right pes of *Mus huegeli*, enlarged.

belly the tips are quite white, and there is also a white ring round the hairs at about halfway from the roots. The head is coloured like the body.

The skull is that of a typical *Mus*, and presents no characters worthy of special remark. In the type specimen the posterior molars both above and below have not quite grown up into their places; so that it is not fully adult.

Measurements, in inches and tenths:—

Length of the head and body	5·0
„ „ tail	4·3
„ „ fore foot, without claws	0·45
„ „ hind foot „ „	1·1
Ear	0·5 × 0·45
Skull ¹ , from hinder edge of parietals to end of nasals	1·1
Nasal bones, length	0·44
Breadth of brain-case	0·63
„ between orbits	0·23
Length of palate, from behind incisors	0·6
„ lower jaw, from condyles to anterior end of symphysis	0·73

The only other indigenous Fijian Mice hitherto described are the

¹ The occipital portion of the skull and the zygomatica have been unfortunately broken away; so that the full length and breadth cannot be given.





1/2

J. S. M. lith.

MYIOPHONEUS CASTANEUS

Hanhart imp.

Mus exulans and *Mus vitiensis* of Peale¹:—the former about six inches long, with hair like a Norway Rat; the latter a house-mouse, about three inches long.

I propose to name this species *Mus huegeli*, after its discoverer, who informs me that it does not frequent the houses of the natives, but is found in long grass among rocks and sand in the mountains. It is very probably the Rat which Mr. H. N. Moseley in his 'Notes by a Naturalist on the 'Challenger,'' mentions (p. 308) as having been chased unsuccessfully among the undergrowth on the mountains, when his party were at Levuka, Ovalau, in 1874.

4. Contributions to the Ornithology of Sumatra.—Report on a Collection from the neighbourhood of Padang. By R. G. WARDLAW RAMSAY, F.Z.S., 67th Regiment.

[Received December 30, 1879.]

(Plate I.)

On the 9th August, 1878, Mr. Carl Bock, a Swedish naturalist, arrived at Padang, on the west coast of Sumatra, with the intention of penetrating into the mountains of the interior to investigate their fauna for the late Marquis of Tweeddale, who had secured his services for that purpose. Mr. Bock (*in epist.*) says that he was considerably delayed by having to go to Batavia, in order to obtain passports from the Governor-General of the Netherlands, India, and a permit to import his guns and ammunition into Sumatra.

Losing as little time as possible, Mr. Bock started towards the mountains, and spent three days at Ayer-mantecior with Dr. Beccari², who had been collecting for several months in the neighbourhood; he then proceeded *via* Tamar-datar and Boca to Mount Sago, which is about seventy miles to the north-east of Padang. The summit of Mount Sago is described as being about 8000 feet above the sea-level, and clad with virgin forest; but the highest point reached by Mr. Bock was 5000 feet. He collected in three weeks about one hundred specimens, although the weather was wet and unfavourable. The bad weather having rendered a longer stay on this mountain inadvisable, he moved southward to Sidjoendjoeng, where, after collecting for some time, he proceeded by a tedious route to Paio in heavy rain. In this locality Mr. Bock collected for about a month, and then, towards the close of the year, again moved southwards a distance of about 100 miles to Mocara-labo and Ayer-angat, near the frontier of Korintzi territory.

At Ayer-angat he was much disappointed at the scarcity of birds,

¹ U.S. Explor. Exped. viii. pp. 47-49, 1848.

² The results of Dr. Beccari's labours have been laid before the public in a paper by Count T. Salvadori, Ann. Mus. Civ. Gen. 1879, pp. 169-253.

having heard so good a report from the natives; but nevertheless he obtained several species which had not been previously procured by him. He was encamped in the midst of a virgin forest, where, as he describes it, no human being was living. Here all his servants got fever, and then he himself was seized; and so he was obliged to strike his camp and retire to a place called Lolo, at 3500 feet. This latter place he made his headquarters for the remainder of his sojourn in the island, and here formed a considerable portion of his collections.

Mr. Bock, in his letters to Lord Tweeddale, much regretted not having provided himself with small shot, as without it he was not able to obtain good specimens of the smaller species. The absence of small birds from the collection is remarkable, the interesting family of the Timeliidæ being, with the exception of the larger genera *Garrulax*, *Trochalopteron*, &c., entirely unrepresented.

As I hope, when sufficient leisure is at my command, to treat the subject more fully, I abstain from publishing at the present time a full list of Mr. Bock's collection, but take the opportunity of making a few remarks upon it, and also of bringing to notice three apparently undescribed species.

The collection forwarded by Mr. Bock was made between the months of August 1878 and January 1879, in the same part of Sumatra as that in which Dr. Beccari was working in the months of June to September in the former year. One of its chief points of interest is that it contains examples of several migratory species, such as *Turdus sibiricus*, Pallas, and *Phylloscopus borealis*, Blasius, which would only occur in the winter season, and would not, therefore, have been met with by Dr. Beccari.

Mr. Bock's collection contains about 800 specimens, which are referable to 166 species. Of these 32 are not included in the lists of the Marquis of Tweeddale (Ibis, 1877, pp. 283-323) or of Count T. Salvadori (Ann. Mus. Civ. Gen. 1879, pp. 169-253); they are as follows:—

1. *Neopus malayensis*, Temm. ex Reinwardt.
- *2. *Accipiter stenvsoni*, Gurney.
- *3. *Milvus govinda*, Sykes.
4. *Caloramphus hayi*, J. E. Gray.
5. *Anthracoceros malayanus* (Raffles).
6. *Hydrocissa conveza* (Temm.).
7. *Merops philippinus*, Linn.
8. *Cypselus subfurcatus*, Blyth.
9. *Collocalia francica* (Gmelin).
10. *Eurylæmus javanicus*, Horsfield.
- *11. *Niltava grandis* (Blyth).
- *12. *Xanthopygia cyanomelæna* (Temm.).
13. *Bhringa remifer* (Temm.).
14. *Phyllornis media*, Bonap. ex Müller MS.
15. *Criniger gutturalis* (Müller).
16. *Iridia squamata* (Temm.).

17. *Iridia leucogrammica* (Müller).
- *18. *Turdus sibiricus*, Pallas.
- *19. — *obscurus*, Gmelin.
20. *Ianthocincla lugubris* (Müller).
21. *Phylloscopus borealis* (Blasius).
22. *Erythrura prasina* (Sparrrn.).
23. *Limonidromus indicus* (Gmelin).
24. *Analcipus cruentus* (Wagler).
25. *Carpophaga ænea* (Linn.).
26. *Euplocamus vieilloti*, G. R. Gray.
- *27. *Turnix pugnax* (Temm.).
28. *Rhynchæa capensis* (Linn.).
29. *Hypotænidia striata* (Linn.).
30. *Bubulcus coromandus* (Bodd.).
31. *Ardetta cinnamomea* (Gmel.).
32. *Dendrocygna arcuata* (Horsf.).

Out of this list seven species, to the names of which an asterisk is prefixed, have, as far as I know, not been before recorded as occurring in Sumatra. In addition to the above-named species are three which appear to be new, viz. :—

DICRURUS SUMATRANUS, sp. n.

This species seems to find its nearest ally in *Dicrurus bimaensis*, Wallace¹, from Lombok, Sumbawa, and Flores. It, however, differs in having the plumage of the back pure black, without any metallic gloss. It also resembles that species in the form of the feathers springing from the base of the maxilla and covering the nostrils; but in the present bird these feathers are much lengthened, reaching over nearly two thirds of the length of the bill. The rictal bristles are also much exaggerated, projecting nearly as far as the point of the bill. The Sumatran bird is also larger than *D. bimaensis*, having a wing of 5·9 inches length against 5·5 in British-Museum examples of the latter species (Wallace gives 5·25, *l. c.*). The tail is nearly square, one specimen only exhibiting a slight tendency in the outer tail-feathers to curl at the tip.

The collection contains ten specimens of this Drongo, collected at Ayer-angat, Paio, and Mount Sago.

Iris vermilion (*Bock*).

TURDINUS MARMORATUS, sp. n.

Reddish chocolate-brown, brightest on the flanks and belly, the feathers of the head and back margined with black, giving those parts a scale-like appearance. Beneath, the chin and throat and upper breast white, each feather with a black terminal bar, which becomes wider towards the breast; the lower part of the breast and centre of abdomen as far as the crissum black, with a terminal or subterminal bar of white across each feather; ear-coverts dark

¹ P. Z. S. 1863, p. 492.

rufous-brown, shading into bright chestnut on the hinder part, and widening into a broad patch on either side of the neck.

Length about 7·5 inches, wing 3·6, bill ·95, tarsus 1·25.

One specimen only of this new species is in the collection.

MYIOPHONEUS CASTANEUS, sp. n. (Plate I.)

Bright chestnut-brown, except on the head, face, throat, and breast, which are dull purplish blue, and the forehead and lesser wing-coverts bright cobalt.

Mount Sago, 3 September, 1878. Iris grey-blue (*Bock*).

In the British Museum I found an example of this bird, labelled "Malacca," but without a name. The locality is probably erroneous. This specimen differs considerably from mine, both in dimensions and colour, the purplish-blue head being overlaid with a tinge of chestnut, and the lores and forehead being dusky chestnut-brown.

The dimensions of the two specimens are—

	Wing.	Bill fr. gape.	Tail.	Tarsus.
Sumatra (<i>Bock</i>)	5·75	¹	3·8	1·7
? Malacca (<i>Mus. Brit.</i>)	5·1	1·32	4	1·7

Of the 24 species described as new by Count Salvadori (*l. c.*), only 8 were obtained by Mr. Bock, viz. :—

<i>Chrysophlegma mystacalis.</i>	<i>Pteruthius cameranoi.</i>
<i>Rhipidura atrata.</i>	<i>Myiophoneus dicrorhynchus.</i>
<i>Hemipus intermedius.</i>	<i>Arrenga melanura.</i>
<i>Heterophasia simillima.</i>	<i>Peloperdix rubrirostris.</i>

Two of these I cannot admit as good species—*Hemipus intermedius* and *Pteruthius cameranoi*. The former, of which I have one good specimen, appears to me to be inseparable from examples in the British Museum of *Hemipus picatus* (Sykes), collected at Mahabaleshwar. The latter I have compared with a specimen in the same museum of *P. æralatus*, Tickell, from the Kachyen hills in Western Yunnan, and found to be identical.

Yet another of the species contained in the above list is, I should say, of somewhat doubtful validity. *Rhipidura atrata* is very close to, if not identical with *R. albicollis* (Vieill.) = *R. fusciventris* (Franklin), of India. It differs, no doubt, in the shade of slaty black of its plumage; but I have found specimens in the British Museum of *R. albicollis* which nearly match the Sumatran examples, although I am bound to say not quite. The difference, however, is so very trifling that the Sumatran bird can, I think, be hardly regarded as belonging to a distinct species.

¹ Bill broken.

5. Description of two new Species of Dwarf Antelope
(*Neotragus*). By Dr. A. GÜNTHER, F.Z.S.

[Received November 21, 1879.]

A Dwarf Antelope obtained by Dr. Kirk near Brava, in the South Somali country, proves to be allied to, and the southern representative of, *Neotragus saltianus* from Abyssinia. Dr. Kirk has sent the skin of a female not quite adult and the head of an adult male; perfect skulls have been extracted from both. I propose for the new species the name of *Neotragus kirkii*.

With regard to size there seems to be no great difference between the two species; but *N. kirkii* is somewhat smaller, and its coloration is very distinct.

In the first place I have to draw attention to the peculiar form of

Fig. 1.



Head of *Neotragus kirkii*.

the muzzle, which is much elongated, protruding beyond the mouth, swollen along its upper profile, and very distensible, resembling in some measure that of the Saiga Antelope. This peculiarity it has most probably in common with the Abyssinian species, though, as far as we can judge from dried skins, it is less developed in this latter; nor do I find it mentioned by any previous writer. I am ignorant of the function in the animal's economy to which it

relates, unless it be the organ by which peculiar sounds are produced, as mentioned by Brehm. It is not peculiar to the male, though more developed in that sex than in the female. The hairs on the crown of the head are prolonged, stiff, pointing backwards to between the ears, forming a flat depressed crest, as in *Neotragus saltianus*.

The colour of the body of the animal is a brownish yellow, finely grizzled with brown—this colour being produced by each hair having two or three broad brown rings, the terminal ring forming sometimes the tip of the hair, sometimes being somewhat remote from it. The grizzly appearance gradually changes into a uniform light reddish-brown, which occupies the whole of the fore and hind legs. The upper part of the throat, the abdomen, and the inner side of the fore legs and thighs are dirty whitish; lower part of the throat tinged with brownish; the long hairs of the head brown, with broad yellowish rings; snout and outer side of the ears brown; a white streak above the eye.

The horns are very similar to those of *Neotragus saltianus*. They are almost parallel, marked by strong, but rather irregular, sub-reticulated annulations, which completely surround the horn; these disappear towards the middle of the length of the horn. The annulated portion is also longitudinally rugose, the terminal third only being smooth.

The following are the measurements of the female:—

	in.
Length of the head	$4\frac{1}{2}$
„ „ ear	$2\frac{1}{4}$
„ „ body and neck	13
„ „ fore leg (from the elbow-joint)	$7\frac{1}{3}$
„ „ hind leg (from the knee)	10
„ „ hind foot (from the heel)	$6\frac{1}{4}$

Measurements of the male:—

Length of the head	$5\frac{1}{2}$
„ „ ear (shrunk)	$2\frac{1}{4}$

I may add that the opening of the lacrymal gland is very distinct, that the tail is very short, apparently composed of a few vertebræ only, and that the spurious claws are as small as in the Abyssinian species.

Any doubts which might have been entertained with regard to the distinctness of this species disappear on comparison of the skulls of the two animals. The lacrymal groove, which in *Neotragus saltianus* is rather shallow, is so much deepened in the Somali species as to receive easily the end of a man's thumb. Secondly, the lateral ramus of the intermaxillary is singularly curved in the shape of an S, very slender, and separated from the lacrymal bone by a broad ascending process of the maxillary, which, therefore, touches the side of the nasal bone (see fig. 2, p. 19). In the Abyssinian species the intermaxillary is straighter and stouter, extending to the lacrymal, with which it forms a suture (see fig. 4, p. 19).

Thirdly, the nasal bones, the shortness of which is characteristic of the genus, are still shorter than in *Neotragus saltianus*; and their posterior margins form an almost straight transverse line, whilst in *Neotragus saltianus* they form an acute angle (see figs. 5 & 6, p. 20).

Fig. 2.

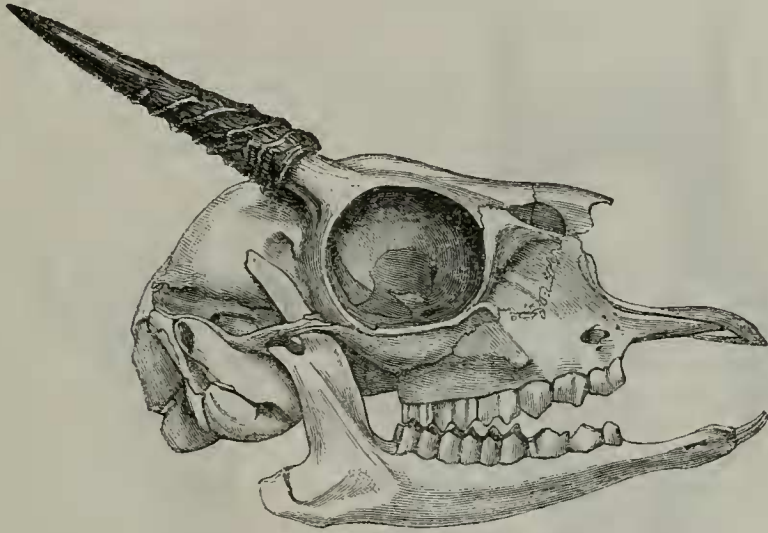
Skull of *Neotragus kirkii*; side view.

Fig. 3.



Fig. 4.

Skull of *Neotragus saltianus*.

Fourthly, the infero-posterior angle of the mandible (fig. 2) is produced backwards, forming a projection beyond the hind margin of the mandible; whilst in *Neotragus saltianus* (fig. 3) the hind margin is only slightly excised. It must be remarked, however, that this peculiarity is much less developed in the young female than in the adult male.

Fifthly, the hindmost molar of the lower jaw has a small third lobe developed behind with a single enamel fold, as in the species from Damara Land (see fig. 12, p. 22); this lobe is entirely absent in *N. saltianus* (see fig. 11, p. 22).

The peculiar conformation of the facial bones is clearly in relation to the developed distensible nasal cavity of this animal. The roof of the nasal cavity is supported by cartilage rather than by bone, to admit of greater flexibility; hence the reduction of the nasal

Fig. 5.

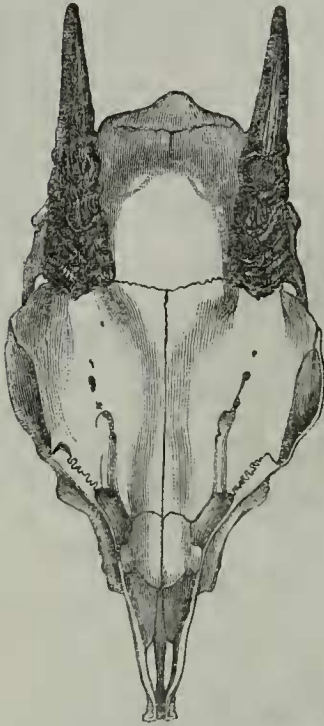
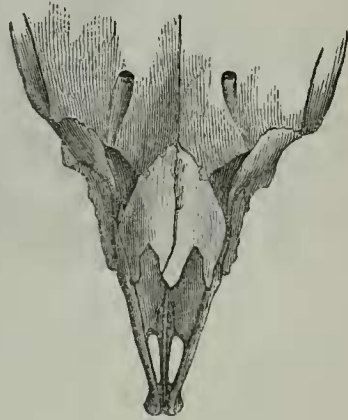


Fig. 6.

Fig. 5. Skull of *Neotragus kirkii*; upper view.Fig. 6. Upper view of facial bone of *Neotragus saltianus*.

bones in *Neotragus* is perfectly analogous to a similar structure in the Saiga Antelope and in the Tapirs.

Since I wrote the preceding remarks Mr. Sclater has kindly placed in my hands a specimen which he had received from Mr. R. Trimen, Curator of the South-African Museum. It had been obtained in Damara Land, and proves to be a third species of this genus, for which I propose the name of *Neotragus damarensis*.

The specimen is the skin of an adult female, from which I have had the skull extracted.

Externally this species resembles so much the Abyssinian *N. saltianus* that it might be taken for a variation of colour. The crest of long cranial hairs is more decidedly black behind than I have seen it in Abyssinian specimens, the majority of the cranial hairs being broadly annulated with black and yellow. The back of the trunk is finely grizzled with black and brownish yellow, the latter colour being replaced behind by grey. The black rings of all